

Matériaux

Bulletin de Veille - 27 septembre 2018

SOMMAIRE

A LA UNE

- Unexplained hole aboard Soyuz puzzles crew, stirs up wild theories

GENERALITES

- Lehigh University Partners with UC Berkeley to Turbo Boost Materials Science
- Plastronique, vision artificielle, imprimante 3D métal HP... les meilleures innovations de la semaine
- The Environment's New Clothes: Biodegradable Textiles Grown from Live Organisms

AEROSPATIAL

- Searching for Life on Mars through the Lens of Greenland

MATERIAUX POUR L'ENERGIE

- Using Hall Effect to Measure Hydrogen Magnetization Response in CoPd Thin Films
- Solar power: Golden sandwich could make the world more sustainable

MATERIAUX POUR L'OPTIQUE

- Fiber optic sensor measures tiny magnetic fields
- Researchers optically trap, move and analyze living cells with laser/microscopy combo
- Single Laser Source Generates Six Entangled Waves, Setting a New Record

NANOMATERIAUX

- New nanoparticle superstructures made from pyramid-shaped building blocks
- 3D electron microscopy uncovers the complex guts of desalination membranes

A LA UNE

Unexplained hole aboard Soyuz puzzles crew, stirs up wild theories

13/09/2018 - www.russianspaceweb.com

According to NASA, on August 29, 2018, mission control in Houston noticed a pressure drop aboard the International Space Station. The six crew members, station Commander Drew Feustel, Flight Engineers Ricky Arnold and Serena Auñón-Chancellor of NASA, Alexander Gerst of ESA (European Space Agency) and Oleg Artemyev and Sergey Prokopyev of the Russian space agency Roskosmos, gathered in the Russian segment of the station and, after extensive checks, reported that the leak appears to be on the Russian side of the orbital outpost. ... spacecraft ... metal ...

GENERALITES - MATERIAUX

Lehigh University Partners with UC Berkeley to Turbo Boost Materials Science

25/09/2018 - www.azom.com



During the course of the project, Agar and his team will develop what they term "an efficient Bayesian-guided computational framework" that will guide the development of a neural network—a computer system designed based on the human brain and nervous system—that will serve to turbo-charge the hunt for new and advanced materials with improved electrical, mechanical, thermal, and magnetic features.

Plastronique, vision artificielle, imprimante 3D métal HP... les meilleures innovations de la semaine

21/09/2018 - www.industrie-techno.com



La pièce a été imprimée par sérigraphie sur des substrats flexibles en polycarbonate, sur la plate-forme d'impression grande surfaces PICTIC du Liten. Le système se contente, pour former une image, d'un simple panneau transparent et d'un capteur photo conventionnel. Le procédé reprend, dans les grandes lignes, celui des imprimantes polymères : un lit de poudre métallique est déposé au fond d'un bac, dans un environnement à haute température.

The Environment's New Clothes: Biodegradable Textiles Grown from Live Organisms

14/09/2018 - www.scientificamerican.com

POLYMERES - ELASTOMERES

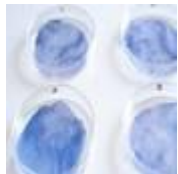
- Interview: Carbon releases first medical-grade material for DLS, partners with Fast Radius

REVETEMENTS

- Spray-on antennas could unlock potential of smart, connected technology
- Technology Provides Perfect Finish

SEMI-CONDUCTEURS

- DuPont Electronics & Imaging Announces Newest In-Mold Electronics Inks



Many of today's garments are woven from plastic-based acrylic, nylon or polyester threads, and cut and sewn in factories. Luchtman says her process involves autoclaving a textile to prevent contamination, then pouring a liquid medium filled with bacterial nutrients over the textile in a container. These ecologically benign textiles are so far limited mostly to the realms of the laboratory, science competitions and high-fashion runways.

AEROSPATIAL

Searching for Life on Mars through the Lens of Greenland

14/09/2018 - blogs.scientificamerican.com



The application of spectral fingerprints of cryoconite collected on Earth (now impossible to be collected on Mars) to the hyperspectral Mars data (not available on Earth) is not a new concept. Continuing collecting in-situ data of cryoconite systems is, therefore, fundamental not only to studying the impact of biological activity on the potential sea level rise from Greenland but also to investigating the potential existence of life on Mars.

MATERIAUX POUR L'ENERGIE

Using Hall Effect to Measure Hydrogen Magnetization Response in CoPd Thin Films

14/09/2018 - www.azom.com



Recently, Alexander Gerber's research group at Tel Aviv University performed a systematic study of hydrogen detection by employing the Extraordinary Hall Effect (EHE) to evaluate the hydrogen magnetization response in cobalt-palladium (CoPd) thin films. Also called the anomalous Hall effect, EHE occurs in ferromagnetic materials and can be considerably larger than the ordinary Hall effect. Therefore, the scientists added cobalt, a ferromagnetic material with magnetic properties that are influenced by the hydrogen absorption in CoPd alloys to induce EHE.

Solar power: Golden sandwich could make the world more sustainable

10/09/2018 - www.sciencedaily.com

In the study published in Nature Nanotechnology, the research team sandwiched a semiconductor, a 30-nanometer titanium dioxide thin-film, between a 100-nanometer gold film and gold nanoparticles to enhance light absorption. When the system is irradiated by light from the gold nanoparticle side, the gold film worked as a mirror, trapping the light in a cavity between two gold layers and helping the nanoparticles absorb more light.

MATERIAUX POUR L'OPTIQUE

Fiber optic sensor measures tiny magnetic fields

19/09/2018 - www.sciencedaily.com

As detailed in The Optical Society (OSA) journal Optics Letters, the researchers fabricated the magnetic sensors using optical fibers and a newly developed polymer-nanoparticle composite that is sensitive to magnetic fields. The sensors can detect the brain's magnetic field, which is

100 million times weaker than the magnetic field of earth. The optical method for detecting weak magnetic fields takes advantage of the fact that a magnetic field causes the polarization of light to rotate, with the degree of rotation dependent on the material through which the light passes.

Researchers optically trap, move and analyze living cells with laser/microscope combo

12/09/2018 - www.sciencedaily.com

Although this has been previously achieved with an optical component known as a liquid-crystal spatial light modulator (LCSLM), that approach requires the use of pinholes matched to each sampling point. "This type of experiment would not previously have been possible because spectra could not be acquired from such rapidly changing locations," said Sinjab. They are also exploring how to miniaturize the instrument by incorporating a custom microscope and spectrometer with a more compact high-power laser. ... polystyrene ...

Single Laser Source Generates Six Entangled Waves, Setting a New Record

11/09/2018 - www.photonics.com



The information that can be encoded by a single wave is limited by the uncertainty principle. The device that generated the entangled states — the OPO — consists of a small crystal between two mirrors. Entanglement — a phenomenon that occurs when groups of particles or waves interact in such a way that the quantum state of each particle or wave cannot be described independently of the others — could be used to transmit information between future quantum devices.

NANOMATERIAUX

New nanoparticle superstructures made from pyramid-shaped building blocks

25/09/2018 - www.nanodaily.com



"Tetrahedra open the possibility of making much more complex structures, and the 3D superstructure we demonstrate here is one of the most complex ever assembled from single nanoparticle components. For their study, Chen and his colleagues dissolved their tetrahedral quantum dots in solution, then allowed the particles to assemble into three different types of superstructures: one-dimensional strands, two-dimensional crystal lattices and three-dimensional supercrystals.

3D electron microscopy uncovers the complex guts of desalination membranes

18/09/2018 - www.sciencedaily.com



These reverse osmosis membranes are layers of material with an active aromatic polyamide layer that allows water molecules through, but screens out 99 to 99.9 percent of the salt. Gomez and his team looked at the internal structure of the polyamide film using high-angle annular dark field scanning transmission electron microscopy (HAADF-STEM) tomography. "We found that the density of the polyamide layer is not homogeneous," said Gomez.

POLYMERES - ELASTOMERES

Interview: Carbon releases first medical-grade material for DLS, partners with Fast Radius

10/09/2018 - 3dprintingindustry.com



Furthermore, Carbon has announced a partnership with Chicago-based Manufacturing technology company and 3D printing service bureau Fast Radius, which will also use DLS to optimize the design of the Steelcase SILQ office chair. Carbon and Fast Radius redesign the Steelcase SILQ chair. Fast Radius and Carbon will be showcasing the Steelcase SILQ office chair and armrest at IMTS in Chicago this week.

REVETEMENTS

Spray-on antennas could unlock potential of smart, connected technology

21/09/2018 - www.sciencedaily.com



In the paper, the Drexel researchers put the spray-on antennas up against a variety of antennas made from these new materials, including graphene, silver ink and carbon nanotubes. "The MXene antenna not only outperformed the macro and micro world of metal antennas, we went beyond the performance of available nanomaterial antennas, while keeping the antenna thickness very low," said Babak Anasori, PhD, a research assistant professor in A.J.

Technology Provides Perfect Finish

11/09/2018 - www.azom.com



A nut processing and packing facility for KP Snacks spanning 8,500 square metres required a hygienic flooring system for one of its major production sites. Extensive trials provided the evidence for this system in this specific environment with its large scale production facilities at Rotherham, south Yorkshire. Chris Fletcher of KP Snacks said: "After extensive trials we found that the best floor product for our needs was the product recommended as it was perfect for our mixed use environment.

SEMI-CONDUCTEURS

DuPont Electronics & Imaging Announces Newest In-Mold Electronics Inks

19/09/2018 - www.azom.com

DuPont Electronics & Imaging today announced that it is launching its second generation of In-Mold Electronic (IME) materials with key advancements in its electrically conductive adhesive, protection encapsulant and crossover dielectric. - Electrically Conductive Adhesive – Significantly more flexible than epoxy-based systems meaning better adhesion after forming; ideal for attaching LEDs and microcircuit controllers; DuPont's newest IME-specific adhesive is purposely designed to flex during forming eliminating the delamination that occurs in more brittle, traditional systems.

Service Information Numérique - Pôle IES

Pour toute information, merci de [nous contacter](#)